TECHNOLOGY DIVISION


# THE SCIENCE NEWS-LETTER

*A Weekly Summary of Current Science*

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## WHITE INDIANS TO BE STUDIED IN HOME COUNTRY BY SCIENTISTS

The White Indians of the Darien region of Panama have been given a preliminary inspection by a committee of scientists consisting of Dr. Ales Hrdlicka, anthropologist of the Smithsonian Institution, as chairman, Dr. Charles B. Davenport of the Station for Experimental Evolution, Cold Spring Harbor, L. I., and Dr. C. W. Stiles of the U. S. Public Health Service. The committee, in a communication to R. O. Marsh, the explorer who discovered the White Indians, recommends a thorough study of the newly found people in their own land by an expedition of scientists.

The committee's letter follows:

"Dear Mr. Marsh:

"The Committee of Drs. Hrdlicka, Davenport and Stiles which you desired to take charge of the study of the "white Indians" of Panama whom you brought to Washington for the purposes of investigation, held a meeting after these Indians were examined last Friday at which the whole matter was discussed and the following conclusions arrived at:

"The problem of the "white Indians" is one of much scientific interest, but its satisfactory solution is only possible by a detailed and all-sided study of these people and their families in their own country.

"The Committee is of the opinion that these investigations should be conducted simultaneously by Anthropology, Genetics, and Pathology.

"In order that the results may be satisfactory it is requisite that the research should be carried on by experienced and reliable men, whose findings will be accepted with confidence by their colleagues.

"The first condition for a successful carrying on of the work should be, in the opinion of the Committee, the training during the remainder of the year of two or three of the persons now in your party in the English language and such terms as it may be necessary to use with the Indians. Considerable questioning will have to be done, particularly by the anthropologist and geneticist, which would be quite impossible without well qualified interpreters. Two of the men of your party, the father of Margaret, and Alfred, would seem particularly promising in this direction. It is felt that the two and one-third months remaining of this year would be sufficient to form these men into invaluable interpreters for the scientific party.

"The Committee would appreciate a statement from you as to whether or not yo

desire it to take charge of whatever further work is to be done on these Indians.

Very truly yours,

A Hrdlicka."

Mr. Marsh states that he intends to cooperate with the scientists in every possible way to facilitate carrying out the recommendations of the committee.

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## WHITE INDIANS HAVE SHORTHAND SPEECH, SAYS SMITHSONIAN LINGUIST

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"The language of the White Indians is the most melodious and smooth sounding variety of speech that can be found anywhere in the world, and is made up of the smallest number of sounds," is the statement of Dr. John P. Harrington, ethnologist of the Smithsonian Institution, who has been studying the language of the three White Indian children recently brought from the Darien region of the Isthmus of Panama to the United States by R. O. Marsh, explorer and engineer.

"It is an exceedingly easy language to learn. It has no sound in it that cannot by pronounced by anybody, without any training or practice. All of its sounds occur in the English language. The effect on the ear is much more pleasant even that that of the melodious Spanish, while by comparison English, French and Russian sound harsh and barbarous.

"The structure of the language is represented by the formula cv, c representing a consonant and v a vowel. It produces an alternating flow of consonant and vowel, consonant and vowel; no two consonants ever come together. This structure is responsible for the great melodiousness of the language.

"It has none of the clicked consonants so abundant in Maya and Hottentot, and it also lacks the difficult "tl" and "tz" combinations of the Aztec. It does not have the "intonation values" of Chinese; that is, the meaning of a word is not changed by the tone of voice in which it is spoken. The accent follows such regular rules that it is not even necessary to indicate it by accent marks such as are used in French.

"It is an analytical language, in which ideas are expressed by separate words In this it is sharply contrasted with practically every other Indian language, which are of the 'agglutinative' type, building long, complex words by sticking separate roots and word-elements together.

"The number of sounds is very small; hence the alphabet will be the shortest one in existence, when the language is reduced to writing. It is the shorthand of languages. The sounds used consist of the five vowels, the two semi-vowels W and Y, and the consonant sounds K, T, Ch, Sh, Ts, S, L, M, N, R and P. This gives eighteen letters; the English alphabet contains twenty-six, and we use many other sounds, like ch and ng, that are not represented by single letters.

"The polynesian languages, for example the Hawaiian, have been thought of as being similar 'shorthand' languages. In print they do look simple, but then spoken they are full of 'choky' sounds in the throat that make them really difficult. These sounds are entirely lacking in the language of the White Indians.

"It may be asked how they can make a sufficient number of roots and affixes to carry on the business of a language with so small a number of sounds. This is done by a very ingenious device, similar to one employed in Finnish. Each sound has two forms, a short and a long. In this way the number of sounds is doubled. In learning the language that is the only thing that must be watched. If a double 'T' occurs it must be pronounced double, and not jammed together, as we frequently do in English.

"One of the most interesting things about this study has been the discovery that girls are taught a different pronunciation from that of boys. There is a distinct 'feminine' method of speech, which is softer and more lisping than the 'masculine' pronunciation. Where the two White Indian boys, Olo, and Sippu, use Ch, Margarita, the girl, uses Ts. For the masculine Sh she substitutes S, and she uses Y and L where they use the harsher K and R. It is somewhat reminiscent of the 'polite accent' that was taught to little girls in English and American 'genteel' society in the last century. Sometimes this 'feminine' pronunciation quite distorts a word. The word for 'chief', for example, is 'sakla'; Margarita calls it 'sayla'. This peculiar 'feminine lisp' makes it possible for one to tell the sex of a speacker even in the dark.

"A similar thing is to be noticed in the speech of animals told of in their folk tales. Each animal has its own 'lisp'. It is not necessary to add, as in English, that 'Bre'r Wolf said'; the listening youngster knows from the 'lisp' that it is a wolf speaking, or a turtle, or a fox. This makes the story more realistic.

"The language is very descriptive. Instead of seeking new stems for names of animals, they call many of them by descriptive terms. For instance the manatee or sea-cow is called 'ti moli', which means 'water cow'. The sea lion is 'ti aclu' or 'water tiger'.

"The children are very eager to tell what they know. They will keep at the game as long and as late as there is any one to listen. They are at the same time very insistent that the words be learned correctly. If a word is mispronounced they will go back and say it over and over until they 'get it across'."

Dr. Harrington learns the language from the children by playing with them. He gets down on the floor, with toys, games and pictures; and the three children point out the various parts and objects and give the names, which he notes down. Many words for the dictionary of the Indian speech which Dr. Harrington is compiling were learned on a trip to the zoological garden, where the three children recognized and named all the animals native to their home. Dr. Harrington is continuing the study of the children's language, with frequent visits, and expects to build up a fairly complete vocabulary before they return to the tropics.

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## QUICK AUTO STOPPING NOT DEPENDENT ON SEX, RACE OR EDUCATION

When it comes to stopping an automobile quickly, race, sex, color or education do not count. But scientific tests for chauffeurs devised by H. H. Allen, automotive expert of the National Bureau of Standards, and Prof. Fred A. Moss, psychologist of the Public Personnel Administration of the Institute for Government Research in Washington, show that experience and natural quickness do affect the amount of time required for the automobile driver to get his feet into action upon the brakes.

They have devised an apparatus that allows the accurate measurements of the time elapsing between the signal to stop and the application ofthe brakes.

The mechanism is very simple. An automobile of the standard gear shift type has been equipped with a tachometer, an instrument much more accurate than a speedometer because it records every revolution of the wheels. Two pistols, muzzle downward, are fastened to the running board of the car. The bullet in the cartridge has been removed and red litharge inserted so that when the pistol is fired a red mark is left on the pavement.

When the tachometer registers a certain speed the examiner fires the first pistol. At this signal the person being tested, immediately removes his foot from the accelerator to the brake automatically discharging the second pistol. The distance between the red marks on the pavement is measured. This distance divided by the speed of driving will show to a thousandth of a second the time required for the response of the driver.

Prof. Moss and Mr. Allen have tried the experiment with a group of men and women students from George Washington University, a group from Howard University, and a number of taxi drivers.

In the group from George Washington there was very little difference in the reaction of the men and the women, each showing an average reaction of about one half of a second. The individuals in the group varied very widely, one individual having a reaction time less than three times as short as other members of the group tested.

In the group chosem from Howard University the reaction compared favorably with the ones from George Washington showing that there was no difference in the races so far as this reaction is concerned.

The reaction of the taxi drivers was more prompt than that of the non-professional drivers, indicating either that drivers can be trained to respond more quickly or that those with a quick reaction seek and are seclected for such positions as taxi drivers. One of the men, who had been driving for fifteen years without an accident showed a reaction of one third of a second.

These tests were carried on in four speeds: 10, 15, 20, and 30 miles an hour. At a speed of 20 miles an hour with a reaction of one half second the car would go only fifteen feet before it began to stop. With the reaction one and one half seconds the car would be run 45 feet before it began to stop. The rate of speed does not affect the response in any way.

To eliminate drivers with a very slow reaction is the object of these tests. It is expected that they will be used in hiring drivers for the government service, and in the cities requiring a driving test for a license. This is one of a number of tests which are being prepared for selecting chauffeurs.

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The highest forms of animal life during the geological period when most of our coal was formed were amphibian, creatures related to modern frogs and salamanders.

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# YOUR MEMORY WILL BE GOOD IF YOU MANAGE IT PROPERLY

By Dr. R. S. Woodworth,

Chairman, Division of Anthropology and Psychology,
National Research Council.

A young college freshman came to see me to ask my advice about his poor memory. His memory was so poor, he said, that he simply could not learn his lessons no matter how much he worked over them. I put him through some memory tests and found that his memory was perfectly normal. Then I asked him how he went to work to learn his lessons, and I found that he had carried over into college his high school habit of simply reading his lessons through and through in a blind passive way. A long college lesson in history he would read through once, then read it through a second time, then a third and sometimes a fourth time, and yet when next day questions were asked upon this lesson he had forgotten the answers. Now the fact was that he had not forgotten the answers but had never known them, for he had not analyzed the reading, understood it or picked out the important points. It was a lack of good management rather than of power of memory. I advised him to read the lesson through once, then to review and analyze it mentally, and finally to consult the book again to check up his analysis. This procedure he found to save him much time and give much better results.

If you ask us what memory is, you see that it amounts to this: You do something all by yourself, which you originally needed assistance to do. If you remember a person's name you can call him by name on sight without any assistance. When you first met this personyou had assistance. Someone told you his name, Good management demands that when you have the assistance at hand you should so use it as to do, right then and there, the very thing that you wish to do later without assistance. When someone has just told you the stranger's name you should look at the stranger and call him by name, either aloud or silently, and so prepare to do this very thing at some later time without assistance. This is the principle of all sound memory training.

Psychologists, after testing the memories of many people, are able to announce two very encouraging results. First, that nearly every one has more power of memory than he imagines, and second, that intensive training produces great improvement in memory. But it should be added as a very important qualification that training does not develop the general faculty of memory, but simply increases the power of doing the particular kind of memory job that is practiced.

The first step towards effective memory training is to decide exactly what sort of memory work you need to improve, so as to devote your effort to this particular job. If you wish to improve your memory for poetry, you must practice memorizing poetry. If you wish to improve your memory for names and faces, you must practice connecting the name with the face. If you wish to improve your memory for telephone numbers, you must practice connecting telephone numbers with the names of subscribers. If you wish to improve your musical memory you must practice memorizing music. If your wife complains because you cannot remember much of interest from the day's experiences to enliven the supper table, what you need to practice is the taking note of interesting items as they occur and then recalling these when the time comes. Great improvement can be made in any of these memory jobs, by devoting time and effort to that particular job. No doubt an expert psychologist adviser could assist any one to improve his memory work, but an intelligent person can do much for himself, once he knows that he needs to train himself for specific memory jobs, and that the problem is one of management rather than of inherent memory power.

The first step is to see exactly what memory job needs to be perfected. The second step would naturally be to proceed to practice this particular job. But just here a very curious state of affairs often comes to light. The man who says he very much desires to improve his memory yet finds it very irksome to work at the details of this particular job. In a way he is indifferent or even unwilling to do this job well. He experiences an inner resistance that interferes with his progress.

If this seems almost an impossibility, consider once more the sad case of the man whose wife finds him very unsatisfactory as a provider of interesting re Is this the sort of man who snaps up eagerly every bit of interesting gossip or happening, and who anticipates the pleasure of recounting his news at the supper table? Does he relish the job of gathering news items for feminine consumption? Possibly not. Quite possibly he is the kind of man who thinks this beneath his dignity. He doesn't regard this as his job in any big sense. When it comes dow to the actual working of this job, he rebels against it. This inner resistance is going to interfere considerably with the improvement which he might make. The chances are that he never will enter into this new game heartily, and will never become a shining example of success in this sort of memory work; but if he can overcome his own resistance it is in his power to improve. It has been done.

Poor memory is due to poor management rather than to an inferior faculty of memory. Any sort of memory can be improved if one discovers exactly what needs to be improved, and if one can play the game heartily.

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## OCEAN SURVEY SHIP SELECTED BY NAVY

The U. S. S. Rainbow, former mother-ship for submarines, is to be fitted out as a floating laboratory and itself sent in search of underwater secrets. The Hydrographic Office of the Navy Department has announced the selection of this vessel for the first of a series of cruises in which the ocean will be surveyed from top to bottom.

The Rainbow is on her way Home from China and the Philippines. On her arrival she will be fitted out with a sonic depth finder for surveying the sea bott and with tanks and laboratories for the collection and examination of living specimens of the denizens of the deep. When fitted out for her scientific work, the Rainbow is expected to take up a progrm of investigation in the region of the Caribbean Sea and the Gulf of Mexico which will later include more extensive surveys in the Atlantic and Pacific oceans, which the Conference on Oceanography has recommended should form a permanent part of naval activities.

Captain F. B. Bassett, chief of the Hydrographic Office and president of th Conference, stated that the Rainbow is especially well adapted to scientific exploration. She is 350 feet long, has a draft of 17 feet and displaces 4350 tons and is amply provided with comfortable cabins and quarters to take care of the extra personnel for scientific work.

During the World War this ship did duty as convoy vessel, as transport, and as mother-ship for submarines. She was originally built as a merchant vessel, but purchased by the Navy at the time of the Spanish-American War. At one time she was assigned as water distilling vessel for the fleet and was fitted with lar apparatus for distilling water.

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## PLANTS INEFFICIENT; WASTE SUN'S ENERGY

Energy from the sun pours on every acre of ground to the equivalent of 1,476 tons of coal during an average 90-day growing season. Of this wealth of power a crop of wheat yielding 50 bushels to the acre, a very high figure, puts into the bin an energy equivalent of less than two-thirds of a ton of coal. These striking figures are given by Dr. H. A. Spoehr, plant physiologist of the Carnegie Institution Coastal Laboratory at Carmel, California, writing in the forthcoming annual report of the Smithsonian Institution.

But inefficient as plants are, Dr. Spoehr points out, they have been the only means of major importance we have had for capturing solar energy and making it available for man's use. The coal and oil deposits, representing sun power captured during long periods and stored ages ago, are being used thousands of times faster than they were originally made, and we shall soon find ourselves up against the proposition of getting our energy supply from day to day as we need it.

Plants, in Dr. Spoehr's opinion, do not hold much promise of effective usefulness when that time comes. They cannot work fast enough, and besides, plant production must be increasingly used to supply food and little can be spared for fuel. Man must use his ingenuity to duplicate and improve upon the process that plants have used for ages, and devise means for the direct capture of the great quantities of sunlight energy that daily waste themselves around us. Little progress has been made so far, but Dr. Spoehr is confident that when the problem is attacked in earnest by scientists it will eventually be solved.

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## SWEDISH EXCAVATIONS DISCLOSE BRONZE AGE AND VIKING RELICS

Three skeletons of persons who died 4,500 years ago in Sweden are among the many valuable relics of the Stone Age which Swedish archeologists have unearthed this summer in their assiduous efforts to reconstruct Sweden's prehistoric past. Other objects among the new finds now being studied are weapons, tools, and pottery from the Stone Age, funeral urns, bronze axes, swords, etc., from the Bronze Age, remains of workshops in the Iron Age, hoards of gold and silver treasures amassed in the Viking Age, and various relics that shed light on medieval life in Sweden.

Another interesting find made earlier in the summer while excavating in the market-place of the ancient town of Visby were the remains of a workshop in which bone objects had been made. Antlers of moose and deer in various states of manufacfure, and various horn objects such as combs, chisels, and punches, were found. These objects, it is said, belong to the latter part of the Iron Age. Relics of medieval times, when Visby was in her prime, are frequently found, the latest being a domestic aquarium, in which, according to custom, fish were preserved alive until the time when they were to be served up in a favorite dish for some merchant prince of the city. Four or five aquariums of this type have previously been found in Visby.

A curious and unique object recently found at Laholm, in the province of Halland, is a flint saw from the Stone Age. And another object of special interest in the study of Stone Age civilization in Sweden is a grindstone for sharpening stone tools and weapons, which has been found this summer near Piteaa, on the Gulf of Bothnia. Piteaa is only about sixty miles south of the Arctic Circle. The curious appearance of this grindstone has led the experts to the theory that it was once used by the Lapps as an idol - a strange elevation in service of a common object that had lost its practical utility at least 3,000 years earlier.

At Laholm were also found intersting relics of the Bronze Age, dating back to 1,500 - 1,000 B.C. The finds include a beautiful bronze sword nearly two feet long, and two exquisitely shaped burial urns, of which one was about one foot in diameter. Bronze Age antiquities of great value will probably be unearthed at Sohoeg, between Trelleborg anc Falsterbo, on the most southerly tip of Sweden. Bronze axes were found on this site half a century ago, and excavations begun in earnest have already yielded hundreds of objects. The finds date back to about 1,500 B.C. The prehistoric burial grounds at Sohoeg are believed to be haunted, and it figures in a great number of ghost stories and weird legends that are a part of the folk lore of this region.

Contrasting with the severe and gloomy character of the preceding ages in the civilization of Sweden is the picturesque and romantic Viking Age. The Viking relics found this summer include ornaments, and coins of silver and gold that testify to the far-flung adventure and commerce of the daring seafarers of the ninth and tenth centuries A.D. Thus at Igeloesa, in Skaane, a farmer recently came across a buried treasure of silver money, 2,037 coins in all. He has just delivered the treasure to the government, and, according to law, has received the value of the silver in weight, or about $86.00, plus one-eighth for the "antiquity value". Most of these coins are English, dated during the reign of Aethelred II, 978 to 916 A.D., and are doubtless part of the tribute money which the Viking raiders of that day exacted from England. The other coins are Irish, German, and Arabic. A lot of Arabic coins of this period have also been found in Ytterenhoerna, in the province of Soedermanland. Between twenty and thirty thousand Arabic coins in all have been found in Sweden and testify to the close commercial relations which the Vikings had with the Near East, as well as with Western Europe.

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## HOPI INDIANS WORSHIP VENUS, MORNING STAR

Venus, goddess of the ancient Romans, is venerated also by the modern Hopi Indians of the American southwest, though in a guise that would hardly be recognized by her classic votaries. Dr. J. Walter Fewkes, chief of the Bureau of American Ethnology, tells of this interesting cult in his account of the use of idols in Hopi worship, in the forthcoming annual report of the Smithsonian Institution.

She is known to the Indians as Talatumsi, the Elder Sister of the Dawn. Her image, rudely carved of wood, and wrapped ina ceremonial blanket, is enshrined in a hollowed-out boulder with a flat rock, sealed in with clay for a door. This door is removed in November every fourth year, when the idol is taken out and carried to the top of the mesa and rites performed near it. The image is regarded with special reverence, and except for the quadrennial services is kept securely sealed in its shrine.

The image of Talatumsi is only one of the many sacred objects of the Hopi. Unlike the Indians of the eastern United States, who made few images, these natives of the desert make and reverence numerous idols, though they do not regard them as gods but only as images of the gods above the cloud or under the earth. Some of the idols are simple natural objects, like pieces of petrified log or meteoric stones; others are more or less elaborately carved animal or human figures of wood or stone. Many of the stone images are very old, and are held in especial awe.

Dr. Fewkes is of the opinion that the custom of carving was not much developed until after the coming of the Spanish padres. Though the Indians declined to

be converted, they adopted the idea of having statues in their own holy places, in addition to the simpler natural objects they had revered before that time.

Many of the images are used by the shamans, or medicine men, in exorcising disease. One type of idol, called a "heart twister", is used when the trouble is supposed to be located in the heart. Most of the heart twisters are made of stone or wood, deeply carved in a spiral pattern, but there is at least one in use among the Hopi that is made of a fossil sea shell.

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## FEELING THE PULSE OF A STAR

By Dr. Edwin E. Slosson

By the new method of analyzing the spectrum of a star, it is now possible to trace regular pulsations through its atmosphere. What caused the fluctuations in the intensity and quality of the light from variable stars has long been a puzzle to astronomers.

By comparing the swinging of a candelabrum with his own pulse beats, Galileo discovered that the period of a pendulum is constant, that is, it does not depend upon the distance through which it swings. Quite similarly the gases in the atmosphere of a variable star are swinging back and forth, in and out, all in the same length of time, but not all through the same distance, as the outermost layer in some of the stars moves very little. Moreover, one layer of the atmosphere receives the motion and passes it on to the next from interior to exterior and back again like a perpetual motion machine. The pulsation of the outer layer takes place last, just as the tipping of the last domino of a falling row; but to make the analogy complete someone would have to stand the dominoes on end again and start the motion backward.

The pulse of the giant star, Eta Aquilae, beats once a week and during this period the star changes from the third to the fourth magnitude, which is easily observed with the naked eye. The change of light accompanies the pulsation through the atmosphere, which carries the energy from the storehouse in the interior to the surface boundary for exportation. During the same time the star changes from a bright orange to a golden color with the increase of radiation.

The cause of these changes has been investigated at the Observatory of the University of Michigan by Prof. W. Carl Rufus. By employing a new method of analyzing the rays from this star he has found that the changes of its light are due to alternate compression and expansion of the atmospheric gases.

Compression is a heating process, and the increase of temperature of the radiating surface makes the star shine more brightly. Expansion produces the opposite effect. So with every beat of the pulse of the star these alternating physical processes are revealed in the rate of flow of its energy as seen by the eye and interpreted by the mind of man.

The source of this inexhaustible supply of energy, however, is a problem that has completely baffled the astronomers in spite of their giant telescopes, their ingenious spectroscopes and sensitive photometers. Energy seems to be a final product in the quest for scientific truth or the most primitive star-stuff from which the universe evolved.

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## DUTCH SCIENTIST FINDS PEARLES IN COCONUTS

Silk purses were made out of sows' ears several years ago by a chemist. Now comes a botanist, Dr. F. W. T. Huenger of Amsterdam, who has made an equally impossible-sounding discovery. He has found pearls in coconuts. The gems are round, perfect in form, milk-white, but lack the iridescent sheen of the oyster pearl. They are very rare and difficult to secure, for the natives of the tropical islands prize them highly as talismans and are reluctant to part with them.

They are formed by a process similar to that which produces shell-fish pearls. Certain coconuts are "blind", that is, they do not have the three "eyes" at the end, to one of which the embryo of the seed is normally attached. Caged inside the nut and unable to develop normally, the embryo becomes impregnated and covered with lime salts from the milk of the coconut.

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## MONSTER METEORITE FOUND IN MIDST OF DESERT

What is described as the most important visitor from the skies ever to fall to earth has been discovered in the North African desert. It is an enormous mass of meteoric stone, with a volume in the neighborhood of 160,000 cubic meters. M. LaCroix, French geologist who studied the meteorite, says it contains same rare metals.

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This Book Should Be In Every Library ---

THE STORY OF COPPER

An authoritative and non-technical book about that marvelous red metal, copper, which has played so great a part in the civilization of mankind since before the beginning of history, written by Watson Davis, C. E. Managing Editor of Science Service. Profusely illustrated with photographs and diagrams and with subject matter amplified by complete reading references, this volume constitutes another of the Century Company's popular, but well-founded books on such subjects a as chemistry, rubber, drugs, etc., which have proved tremendously absorbing to the American reading public. We recommend The Story of Copper as a worth-while entertaining story to the students of science and the lay-reader alike. Order direct from Science Service. Price $3.00 per copy, postpaid.

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